

# **MICRONEEDLE DEVICES AND METHODS OF MANUFACTURE AND USE THEREOF**

## **Abstract of the Disclosure**

Microneedle devices are provided for transport of therapeutic and biological molecules across tissue barriers and for use as microflameholders. In a preferred embodiment for transport across tissue, the microneedles are formed of a biodegradable polymer. Methods of making these devices, which can include hollow and/or porous microneedles, are also provided. A preferred method for making a microneedle includes forming a micromold having sidewalls which define the outer surface of the microneedle, electroplating the sidewalls to form the hollow microneedle, and then removing the micromold from the microneedle. In a preferred method of use, the microneedle device is used to deliver fluid material into or across a biological barrier from one or more chambers in fluid connection with at least one of the microneedles. The device preferably further includes a means for controlling the flow of material through the microneedles. Representative examples of these means include the use of permeable membranes, fracturable impermeable membranes, valves, and pumps.